

the species now maintains a spawning population within the Endrick Water, there is an implication that the conservation strategy for this river should be modified to include sea lamprey as a qualifying feature of the SAC.

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A record of the aurochs, *Bos primigenius*, from Morayshire

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In May 2004 two horn cores attached to the frontal bone of a skull (Fig. 1) were discovered at the bottom of the main drainage ditch in the northeast corner of Ardgye Farm, three miles west of Elgin in Morayshire (Grid Reference NJ155638). These horn cores were recovered by Martin Bridges, the Moray Estates farm manager, and were sent to the National Museums Scotland for identification and conservation. Comparison with specimens in the NMS collection confirmed that the horn cores were from an aurochs, *Bos primigenius*. From their size and shape the horn cores were probably from a male. The left horn core measures 700 mm on the outside of the curve and 550 mm on the inside of the curve, whereas the right horn core measures 670 mm on the outside curve and 570 mm on the inside curve. The basal circumferences of the horn cores are 350 mm (right) and 340 mm (left). A bone sample was sent to SUERC, East Kilbride, where it yielded a radiocarbon date of 9690 ± 35 BP and a calibrated date of 11,120-11,260 BP (SUERC-20754).

Calendar dates are increasingly underestimated by increasingly earlier radiocarbon dates (Lowe and Walker, 1997). This is because the amount of radiocarbon in the atmosphere has not been constant over time. Uncalibrated dates can be corrected using a calibration curve that is derived from samples that have been dated independently with other methods such as uranium time series, dendrochronology, varves and deep ocean sediment cores.

The aurochs is widely recorded in Scotland and the rest of Britain. Yalden (1999) records 30 Scottish sites ranging from Orkney to Berwick in the south east and New Galloway in the south west. However, most records are from the Borders with a few in Perthshire. Therefore, these horn cores represent one of the most northerly records in Scotland.

There are few radiocarbon dates for aurochs in Scotland. Kitchener & Bonsall (1999) give five dates,

ranging from 9170 ± 70 BP (10,350-9,980 Cal BP age – AA18516) for a skull from Newburgh, Fife to 3315 ± 55 bp (3690-3390 cal BP – AA-18517) for skull from Galloway. The latter is one of the most recent dates for Britain, suggesting that it survived until at least the early Bronze Age in Scotland (Yalden & Kitchener, 2008). A similar date was recorded for a skeleton from Charterhouse Warren Farm, Somerset (Burleigh & Clutton-Brock, 1977). However, the Ardyge Farm specimen is the oldest recorded post-glacial date for an aurochs in Scotland, and demonstrates that this species was an early post-glacial coloniser.



a.



b.

Fig. 1. Dorsal (a.) and ventral (b.) views of the horn cores of an aurochs, *Bos primigenius*, from Ardyge Farm, Morayshire (Neil McLean, National Museums Scotland).

The horn cores are available for viewing by appointment at Moray Estates (013096 72213 or admin@medeo.co.uk).

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The rare green alga *Pediastrum privum* (Chlorophyta, Sphaeropleales) in a Scottish kettle loch: new to British freshwaters

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Pediastrum is a widely-distributed genus of green alga characteristically consisting of disc-shaped colonies or 'coenobia', assembled from at least four inter-connecting cells (Komárek & Jankovská, 2001).

Many species belonging to the genus are common constituents of lake phytoplankton communities, though *Pediastrum privum* (Printz) Hegewald [= *Stauridium privum* (Printz) Hegewald in Buchheim *et al.*, 2005] is notably rare (Komárek & Jankovská, 2001; Tsarenko & John, 2011). There appear to be no published records from Britain. Sporadic lake phytoplankton and sub-fossil sediment finds from Europe, reflect a sparse scattering of *Pediastrum privum*, confined mostly to temperate and sub-arctic latitudes of the northern hemisphere (Hegewald & Schnepf, 1979; Komárek & Jankovská, 2001; Geriš, 2004; Kowalska & Wołowksi, 2010). By comparison, the close phylogenetic relative *Pediastrum tetras* (Ehrenberg) Ralfs [= *Stauridium tetras* (Ehrenberg) Hegewald in Buchheim *et al.*, 2005] displays a cosmopolitan distribution (Komárek & Jankovská, 2001).

Freshwater phytoplankton communities are important indicators of the biointegrity of standing waters and are therefore used by the Scottish Environment Protection Agency (SEPA) to assess the ecological status of around 80 freshwater lochs in Scotland. Phytoplankton samples are collected at varying frequencies, but at a minimum are taken three times a year between July and September. Sub-samples of phytoplankton (preserved in Lugol's iodine) are examined using an inverted microscope and analysed according to standard